Service Manual

NATIONAL
HI-FI COMPONENTS
PANASONIC

4 CHANNEL AUDIO SCOPE

MODEL SH-3433

* This service manual includes only the changes of the **SH-3433** service manual (ORDER NO. AD-027).
* This manual should be filed with the service manual for model **SH-3433** (ORDER NO. AD-027).
* When servicing model **SH-3433** this service manual and the **SH-3433** (ORDER NO. AD-027) service manual should be used together.

■ SPECIFICATIONS

Power Supply : 110/120/220/240V (50/60 Hz)
Dimentions (W×H×D) : 410×140×340mm (16⅛″×5½″×13⅜″)
Weight : 6.6 kg (14.6 lbs.)

■ REPLACEMENT PARTS LIST

● Addition

Refer No.	Change of Part No. SH-3433 (AD-027)	→ SH-3433 (AD-028)	Description	Per Set (Pcs.)	Remarks	Price
T705	SLTA5L7-A	SLTA5W2-A	Power Transformer	1	Ⓝ X	
R306, 307	ERD14TJ334	ERD12TJ274	270kΩ, 1/2W, ±5%, Carbon(Refer to fig. 1)	2	Y	
R308	ERD14TJ154	ERD12TJ274	270kΩ, 1/2W, ±5%, Carbon(Refer to fig. 1)	1	Y	
R318	●	ERD14TJ393	39kΩ, 1/4W, ±5%, Carbon(Refer to fig. 1)	1	Y	
S6	SSHA14S	SSHA15S	Power Source Switch	1	X	
S7	●	SSRA8	Voltage Selector Switch (Refer to fig. 2 & 3)	1	X	
CA4	SGWA960	SGWA990	Panel	1	Ⓝ Z	
CA11	SGWA780	SGWA780-1	Ornament, Scope Scale	1	Z	
CA20	SKAA570	SKAA460	Cabinet, Metallic	1	Y	
CA22	XSB4+10BVCS	XSB4+10KS	Screw, Cabinet M'tg.	4	Z	
CA25	SGPA240A	SGPA242A	Rear Panel	1	Ⓝ Z	
CA27	SGTA1260	SGTA1290	Name Plate	1	Ⓝ Z	
CA32	RJA34	RJA30	Cord, AC Power Source	1	X	
A8	●	SJP15S	Plug, AC Power Source (Refer to fig. 5)	1	Y	
A9	●	RJP74	Plug, AC Power Source (Refer to fig. 6)	1	Y	
A10	●	RJP75	Plug, AC Power Source (Refer to fig. 7)	1	Y	

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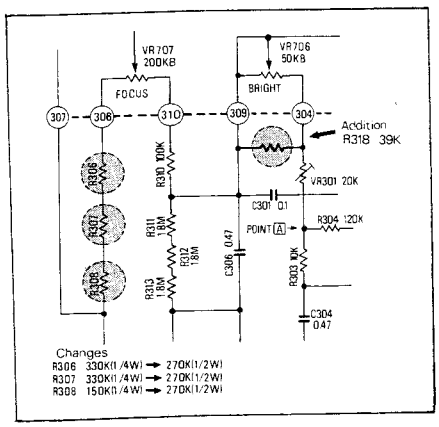
MATSUSHITA ELECTRIC TRADING CO., LTD.
P. O. Box 288 Central, Osaka, Japan

ORDER NO. AD-028

● Addition

Refer No.	Change of Part No.		Description	Per Set (Pcs.)	Remarks	Price
	SH-3433 (AD-027)	➡ SH-3433 (AD-028)				
P3	SPSA21	SPSA24	Pad [Inner]	1	Z	
P4	SPSA23	SPSA26	Pad [Lower]	1	Ⓝ Z	
P5	SPSA22	SPSA25	Pad [Upper]	1	Ⓝ Z	
P6	SPGA50A	SPNA60A	Carton Box [Inner]	1	Ⓝ Z	
P7	SQFA131	SQFA136	Printed Matter (Complete)	1	Ⓝ Y	
	SQXA5082	SQXA5086	Instructions Book (Order SQFA136)	(1)		
P8	●	SPSA32	Pad, Inner Carton Box (Refer to fig. 4)	1	Z	
P9	●	SPGA52A	Carton Box [Outer] (Refer to fig. 4)	1	Ⓝ Z	

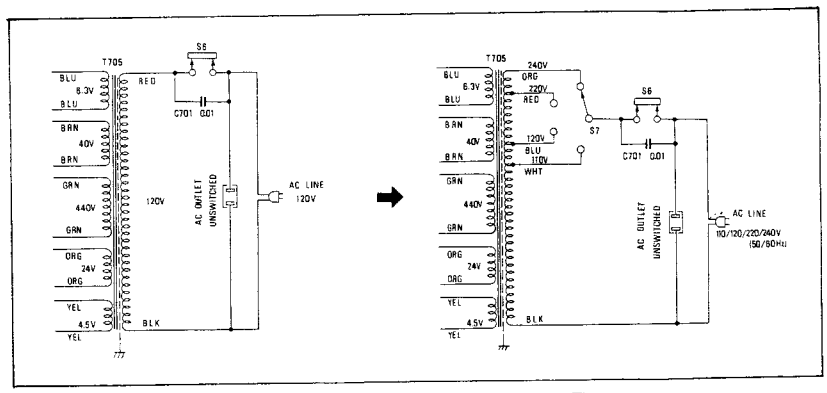
■ CHANGE OF SCHEMATIC DIAGRAMS



(HIGH VOLTAGE CIRCUIT)

Fig. 1

SH-3433 (AD-027) ➡ SH-3433 (AD-028)



(CHANGE OF POWER SOURCE CIRCUIT)

Fig. 2

■ CABINET PARTS AND PACKING PARTS

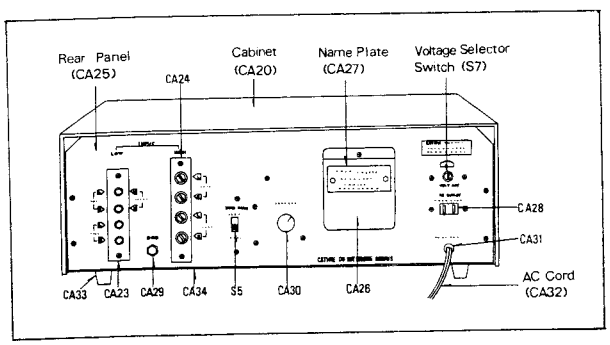


Fig. 3

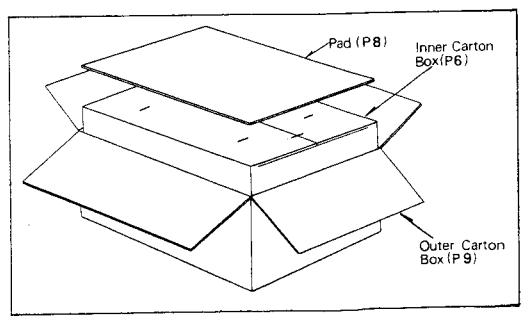


Fig. 4

■ ACCESSORIES

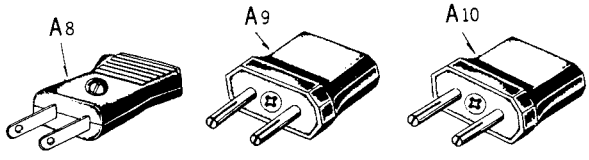


Fig. 5 **Fig. 6** **Fig. 7**

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Service Manual

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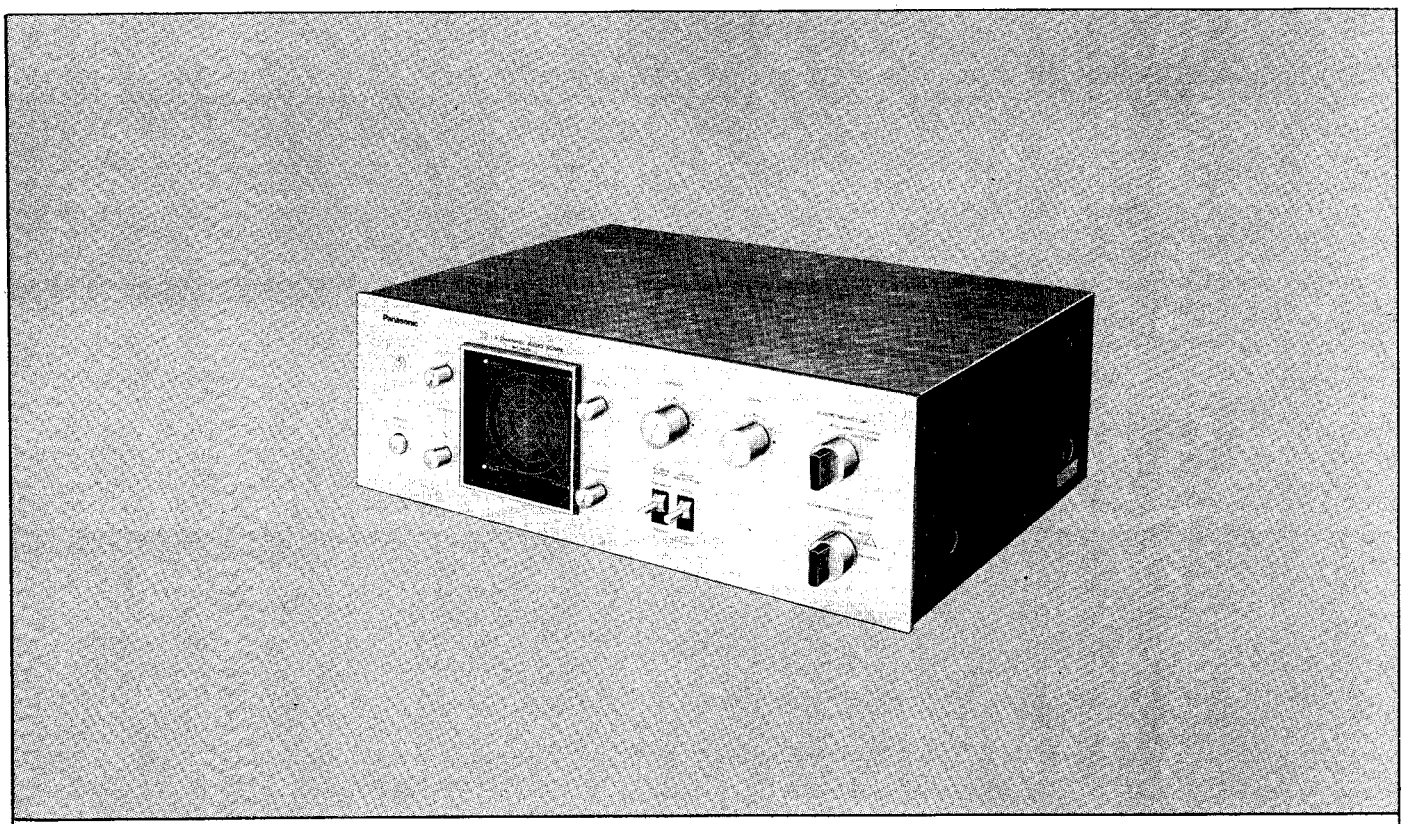


4 CHANNEL AUDIO SCOPE

MODEL **SH-3433**

TECHNICAL SPECIFICATIONS (For accommodating future improvements, specifications are subject to change without notice.)

4 CH AFD

Position :		±10mm
Input Sensitivity :	LOW	15 mV/cm
	Maximum Input	2 V
	HIGH	800 mV/cm
	Maximum Input	35 V
Input Impedance :	LOW	25 kΩ
	HIGH	47 kΩ

WAVE FORM

Input Sensitivity :	LOW	15 mV/cm
	Maximum Input	2 V
	HIGH	800 mV/cm
	Maximum Input	35 V
Input Impedance :	LOW	100 kΩ
	HIGH	47 kΩ

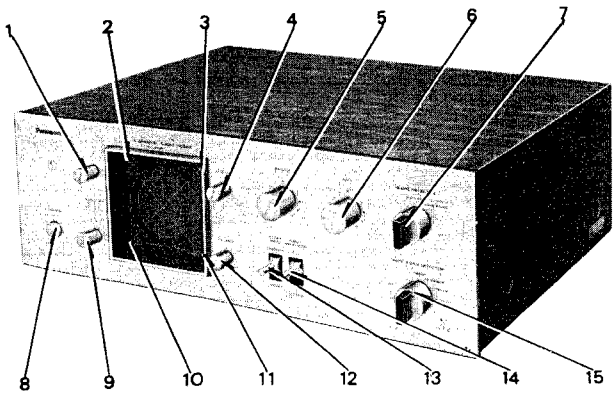
GENERAL

Power Consumption :	10 W
Power Supply :	120 V, 60 Hz
Dimensions (W × H × D) :	16⅛″ × 5½″ × 13⅜″
Weight :	14.6 lbs.

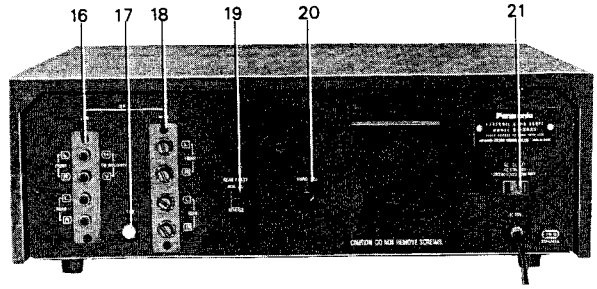
MATSUSHITA ELECTRIC CORP. OF AMERICA Pan-Am Bldg., 200 Park Ave. New York, N.Y. 10017
MATSUSHITA ELECTRIC OF HAWAII, INC. 320, Waiakamilo Road Honolulu, Hawaii 96817
MATSUSHITA ELECTRIC OF CANADA LTD. 40 Ronson Drive, Rexdale, Ont.

ORDER NO. AD-027

■ LOCATION OF CONTROLS



1. POSITION CONTROL (↗)
2. LEFT FRONT INDICATOR
3. RIGHT FRONT INDICATOR
4. FOCUS CONTROL
5. BRIGHT CONTROL
6. GAIN CONTROL
7. SCOPE SELECTOR SWITCH
8. POWER SOURCE SWITCH
9. POSITION CONTROL (↖)
10. LEFT REAR INDICATOR
11. RIGHT REAR INDICATOR
12. SCOPE BALANCE CONTROL
13. SCOPE MODE SWITCH
14. INPUT SELECTOR SWITCH
15. WAVE FORM SELECTOR SWITCH



16. LOW INPUT TERMINALS
17. GROUND TERMINAL
18. HIGH INPUT TERMINALS
19. REAR PHASE SWITCH
20. HORIZONTAL ADJUSTMENT
21. AC POWER OUTLET

■ TO REMOVE FRONT PANEL

1. Remove cabinet from chassis.
2. Remove eight (8) control knobs from front of set.
3. Remove six (6) panel mounting black screws, nos. ① ~ ⑥, as illustrated in figure 1 and 2.
4. Remove front panel from chassis.
5. To reassemble, reverse the above procedure.

■ TO REMOVE BOTTOM BOARD

1. Remove nine (9) bottom board mounting red screws, nos. ⑦ ~ ⑮, as illustrated in figure 2.

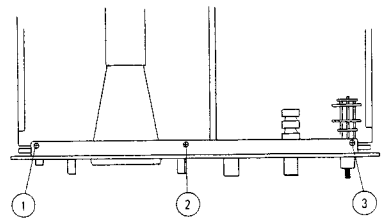


Fig. 1

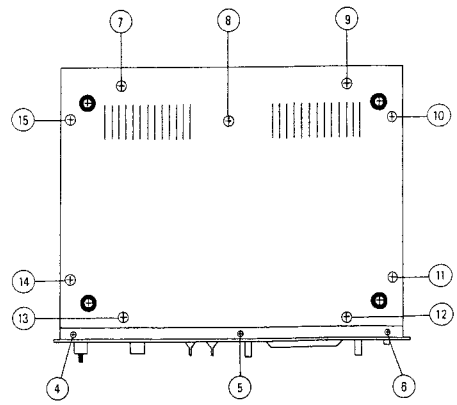


Fig. 2

■ ALIGNMENT POINTS

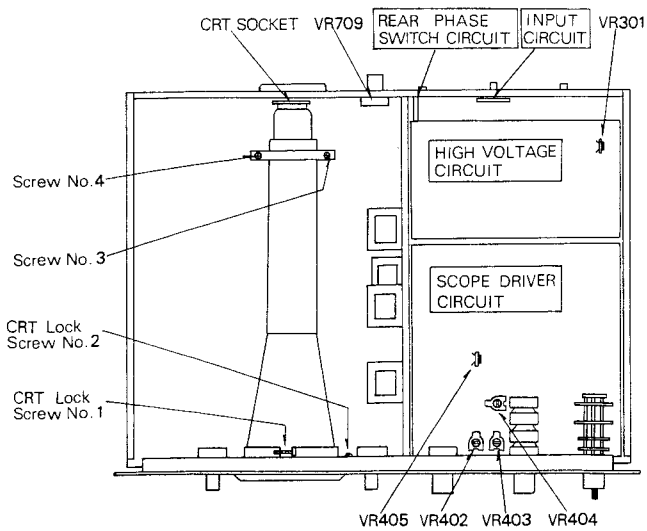


Fig. 3

■ TO REMOVE CATHODE RAY TUBE (CR

1. Remove cabinet from chassis.
2. Remove two (2) CRT mounting screws, nos. 3 and 4, as illustrated in figure 3.
3. Remove two (2) CRT lock mounting screws, nos. 1 and 2, as illustrated in figure 3.
4. Remove CRT from CRT mounting bracket and also remove CRT socket.

■ ALIGNMENT INSTRUCTIONS

"BE CAREFULL OF HIGH VOLTAGE"

A voltage of more than 1000V is present in the high voltage circuitry, at the CRT socket, the focus control and the bright control variable resistors.

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

HOW TO ALIGN THE POSITION OF THE CRT

Notes :
1. When removing the CRT, the following adjustments should be made.
2. Set bright control to center.
3. Set scope selector switch to 4CH AFD.
4. Maintain line voltage at 120 volts.

1. Move the bright spot on the scope using the signal position control **(VR705, 706)** until the bright spot moves along the scale line. Refer to figure 4.
2. Lock the CRT in place with the CRT lock screws No. 1 and No. 2. Refer to figure 3.
3. Cement CRT lock screw with lacquer.
4. Set scope selector switch to WAVE FORM.
5. Adjust horizontally bright line by horizontal control volume **(VR709)**.

WAVE ALIGNMENT

Notes :
1. Set scope selector switch to WAVE FORM.
2. Set wave form selector switch to L-FRONT.
3. Maintain line voltage at 120 volts.

1. Apply a 100mV, 5kHz signal to the left front terminal (Low Input) located on the rear of the cabinet and synchronize.
2. Regulate with the wave control **(VR402, 403)** until the best looking sine wave is obtained. Refer to figure 5.

(If the wave is too large, correct regulation can't be obtained.)

RECTILINEAR WAVE ALIGNMENT

Notes :
1. Set scope selector switch to 4CH AFD.
2. Set gain control to Maximum.
3. Maintain line voltage at 120 volts.

INPUT SIGNAL	INPUT (LOW) TERMINAL	ADJUSTMENT POINT	REMARKS
1 kHz	Connecting oscillator to L_F and R_F terminals.	**VR404**	Maintaining a constant input level and phase, regulate until the conditions are the same as those indicated in figure 6.
1 kHz	Connecting oscillator to L_R and R_R terminals.	**VR405**	Maintaining a constant input level and phase, regulate until the conditions are the same as those indicated in figure 7.

BRIGHTNESS ALIGNMENT

1. Set the bright control on the front panel to the maximum position.
2. Connect a DC voltmeter between terminal **309** on the high voltage unit and **POINT** [A]. Refer to figure 8.
3. Adjust **VR301** to obtain 20V.

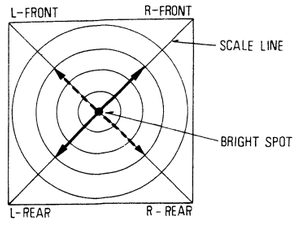


Fig. 4

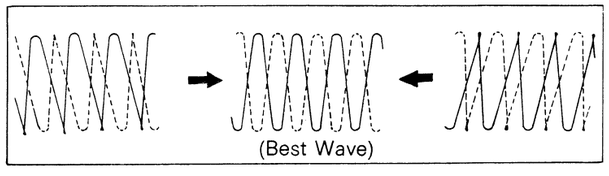


Fig. 5

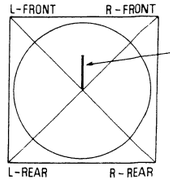


Fig. 6

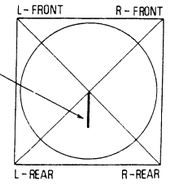


Fig. 7

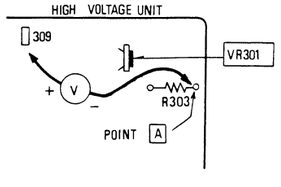
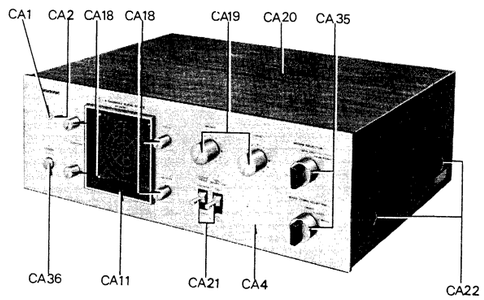
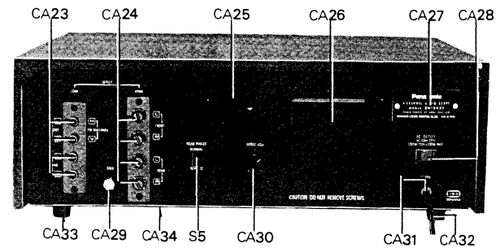
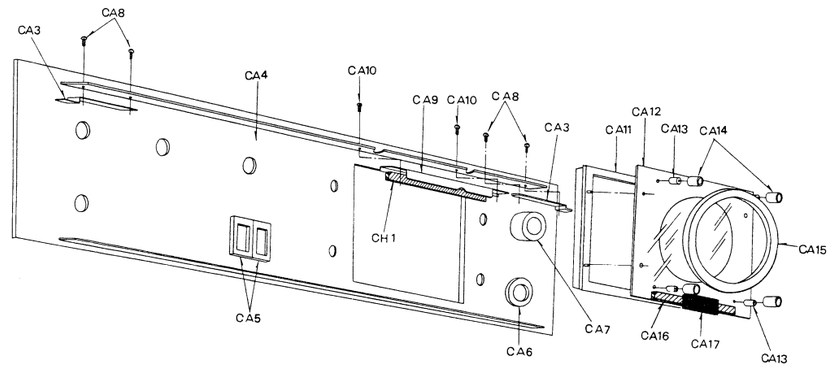


Fig. 8

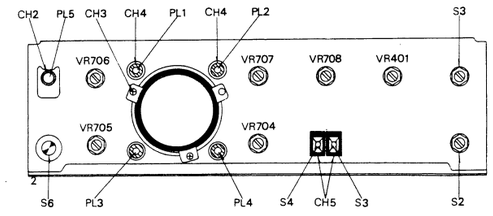
■ CABINET PARTS LOCATIONS

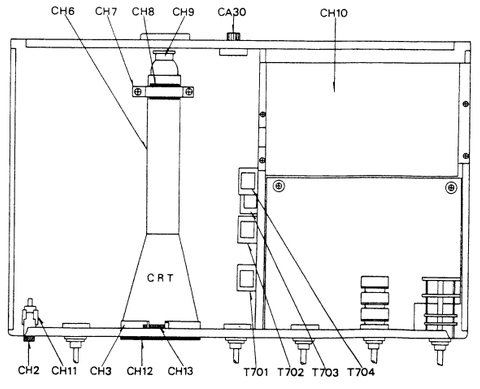




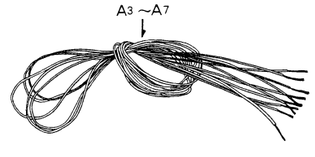


■ CHASSIS PARTS LOCATIONS

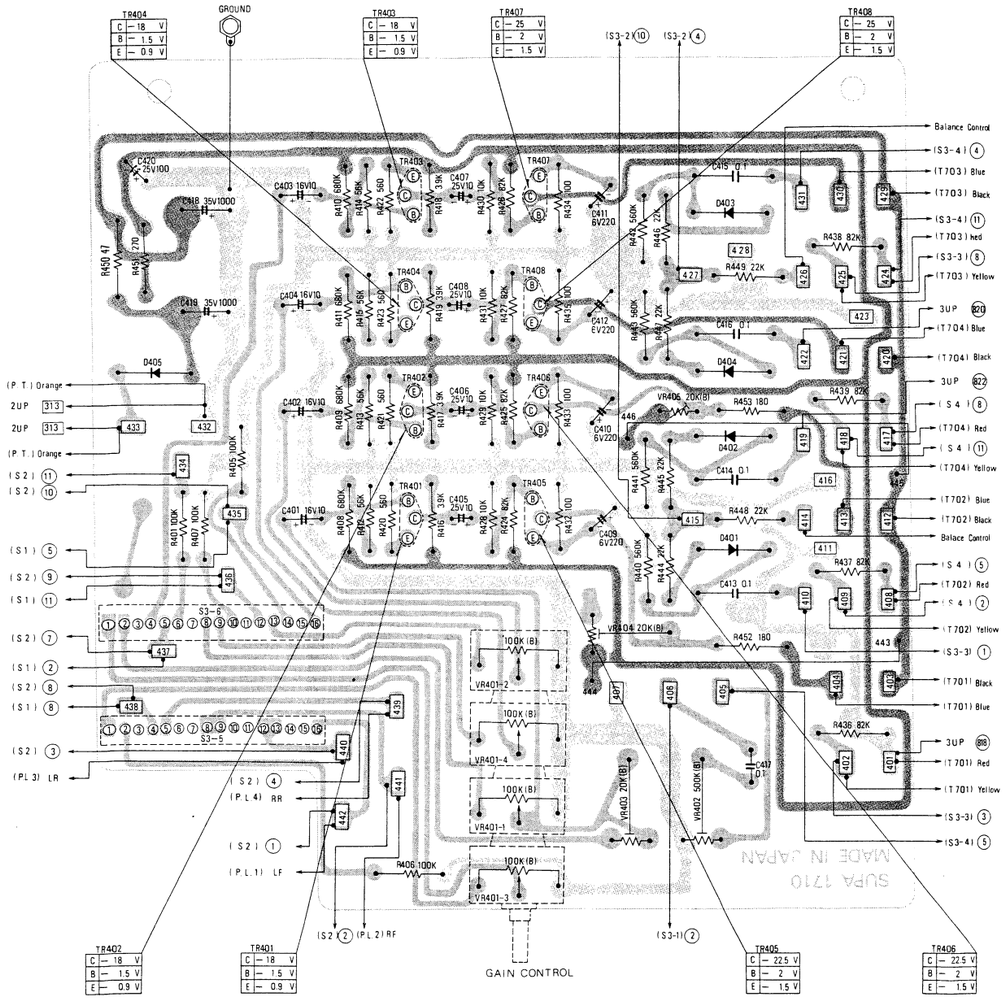




■ ACCESSORIES



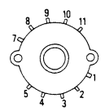
SCOPE DRIVER Circuit Board (IUP)



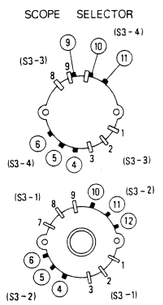
TERMINAL NUMBER OF SWITCHES

CRT SOCKET

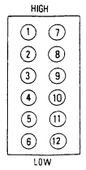
WAVE FORM SELECTOR (S2)



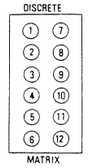
SCOPE SELECTOR



INPUT SELECTOR (S1)

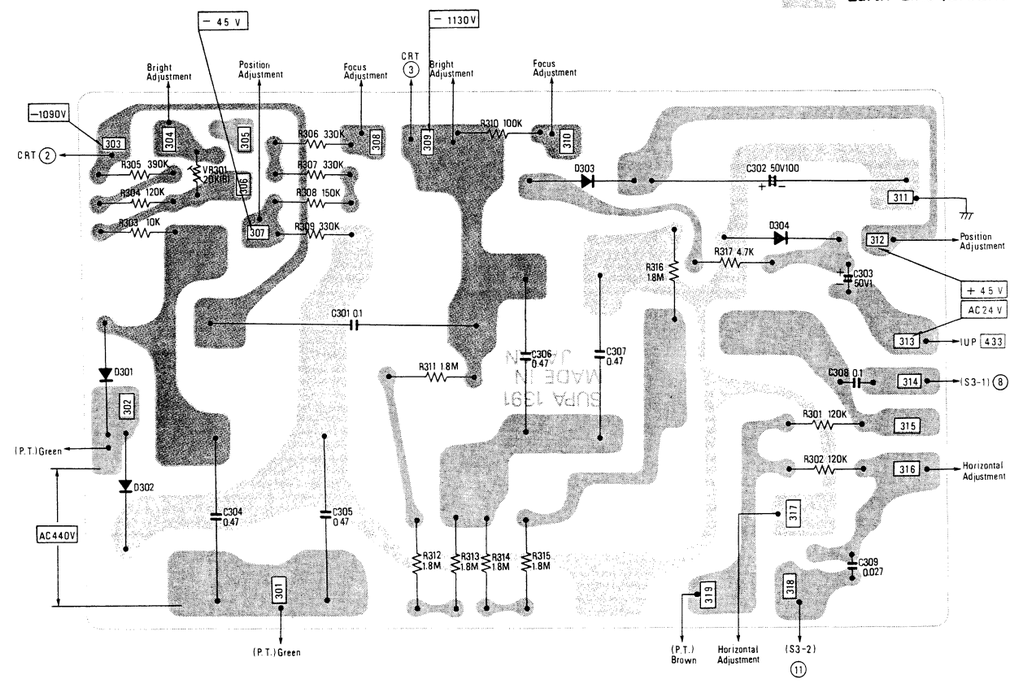


SCOPE MODE (S4)

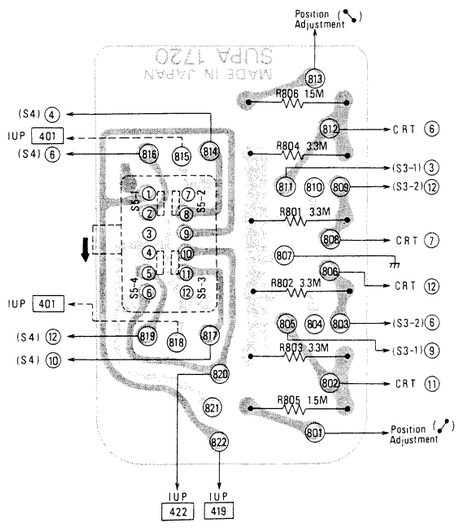


HIGH VOLTAGE Circuit Board (2 UP)

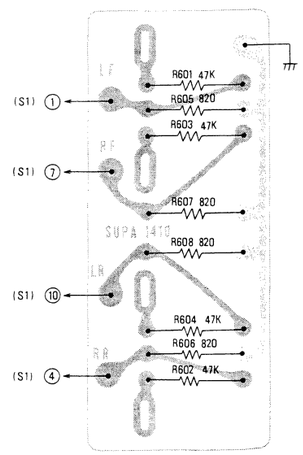
Positive Voltage Line
⊖ B Voltage Line
Earth Line (Ground)



REAR PHASE SWITCH Circuit Board (3 UP)



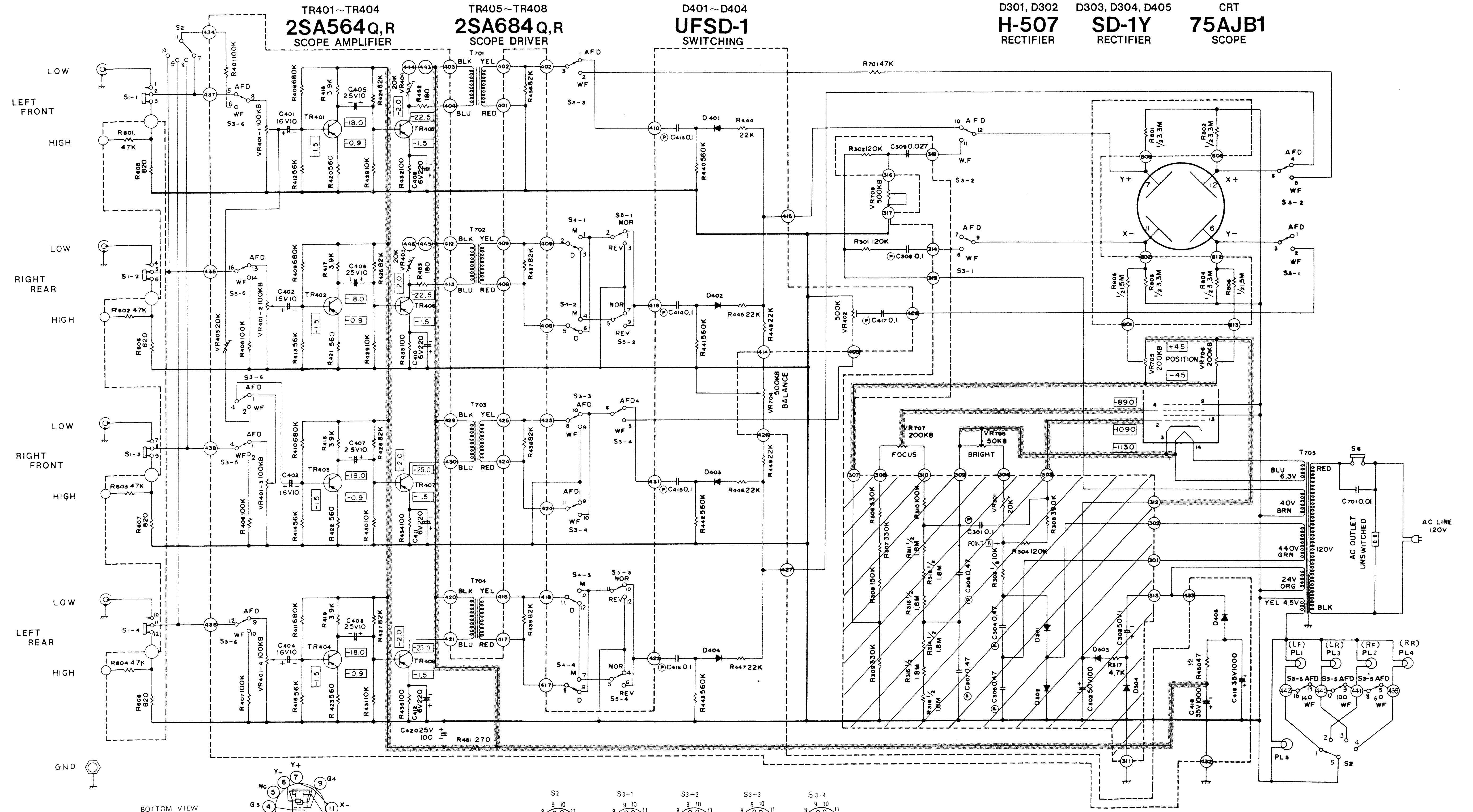
INPUT Circuit Board (4 UP)

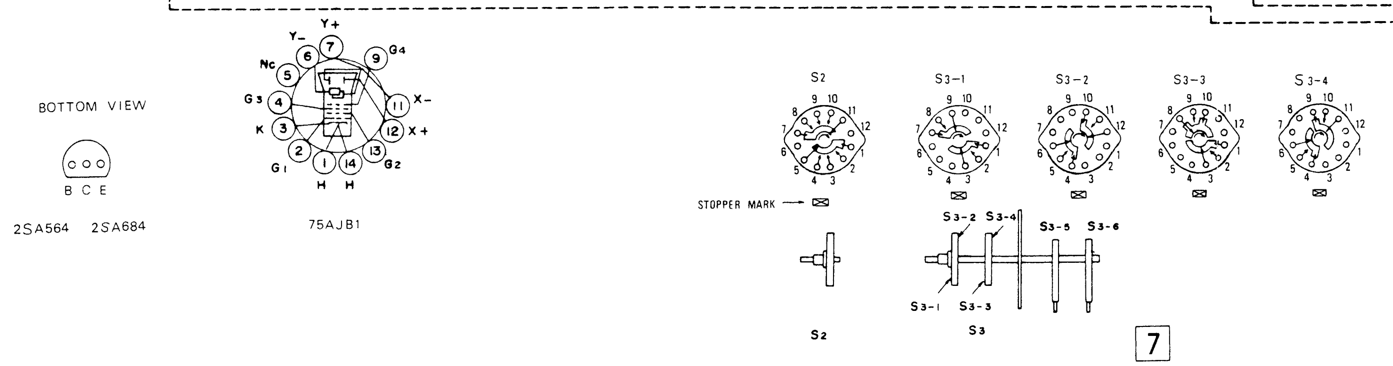


Schematic Diagram — Model SH-3433

(This schematic diagram may be modified at any time with the development of technology)

Positive Voltage Line
⊖B Voltage Line
High Voltage Circuit





Notes :

1. **S1-1～S1-4** : Input selector switch in "**HIGH**" position. HIGH ↔ LOW
2. **S2** : Wave form selector switch in "**L-FRONT**" position. L-FRONT ↔ R-FRONT ↔ L-REAR ↔ R-REAR
3. **S3-1～S3-6** : Scope selector switch in "**4 CH AFD**" position. 4 CH AFD ↔ WAVE FORM
4. **S4-1～S4-4** : Scope mode switch in "**DISCRETE**" position. DISCRETE ↔ MATRIX
5. **S5-1～S5-4** : Rear phase switch in "**NORMAL**" position. NORMAL ↔ REVERSE
6. **S6** : Power source switch in "**ON**" position. ON ↔ OFF
7. ▭ DC voltage measurements are taken with circuit tester from chassis.
8. **AFD** mark is 4 channel AFD
9. **WF** mark is Wave Form
10. **D** mark is Discrete
11. **M** mark is Matrix
12. **NOR** mark is Normal
13. **REV** mark is Reverse
14. Ⓟ mark is Polyester Capacitor

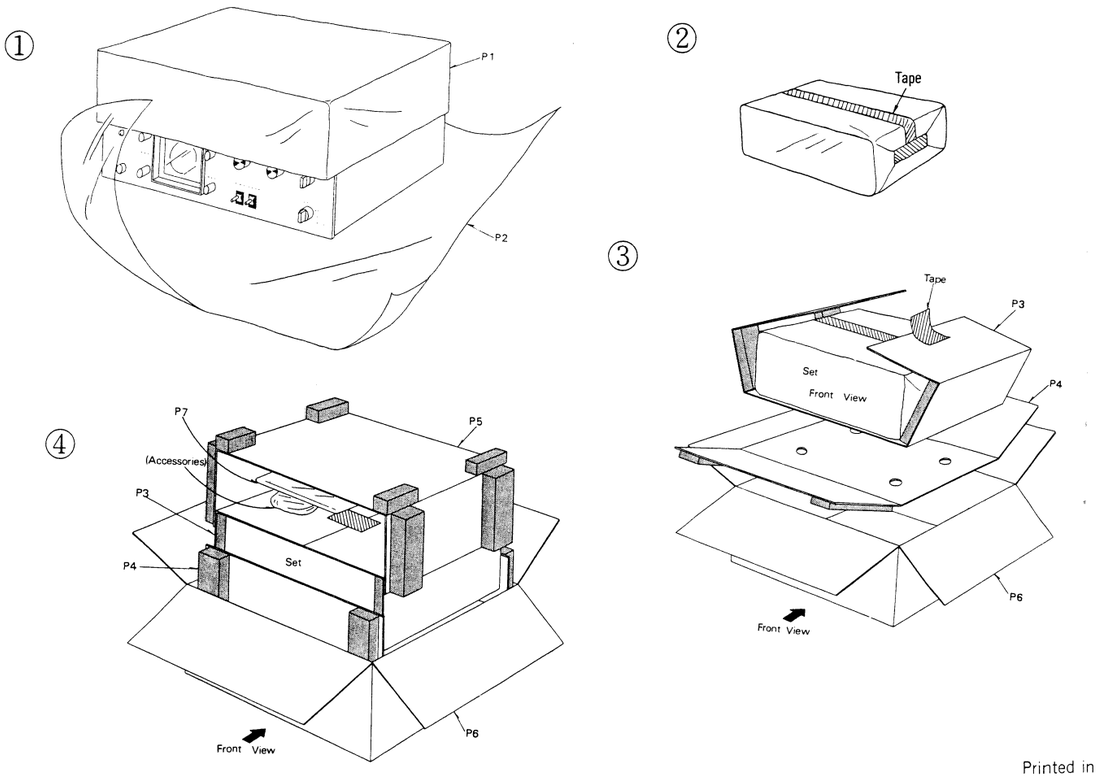
■ REPLACEMENT PARTS LIST

NOTES:

1. Part numbers indicated on most mechanical parts. Please use this Part number for parts orders.
2. Ⓝ indicates the New Parts.
3. **X-Z** rank **X** rank parts will cover 80% of repair needs. **X+Y** rank parts will cover 95% of repair needs. **Z** rank parts are less necessary.

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
TRANSISTORS and DIODES				
TR401,402,403,404	2SA564Q,R	Scope Amplifier	4	X
TR405,406,407,408	2SA684Q,R	Scope Driver Amplifier	4	X
D301,302	RVDH-507	Rectifier	2	Ⓝ X
D303,304,405	RVDSD-1Y	Rectifier	3	X
D401,402,403,404	RVDUFSD-1	Switching	4	Ⓝ X
CATHODE RAY TUBE				
CRT	75AJB1	Cathode Ray Tube	1	Ⓝ X
TRANSFORMERS				
T701,702,703,704	SLTA2I1-A	Driver Transformer	4	Ⓝ X
T705	SLTA5L7-A	Power Transformer	1	Ⓝ X
RESISTORS				
R432,433,434,435	ERD14TJ101	100Ω, 1/4W, ± 5%, Carbon	4	Y
R452,453	ERD14TJ181	180Ω, 1/4W, ± 5%, Carbon	2	Y
R451	ERD14TJ271	270Ω, 1/4W, ± 5%, Carbon	1	Y
R420,421,422,423	ERD14TJ561	560Ω, 1/4W, ± 5%, Carbon	4	Y
R605,606,607,608	ERD14TJ821	820Ω, 1/4W, ± 5%, Carbon	4	Y
R416,417,418,419	ERD14TJ392	3.9kΩ, 1/4W, ± 5%, Carbon	4	Y
R317	ERD14TJ472	4.7kΩ, 1/4W, ± 5%, Carbon	1	Y
R428,429,430,431	ERD14TJ103	10kΩ, 1/4W, ± 5%, Carbon	4	Y
R444,445,446,447,448,449	ERD14TJ223	22kΩ, 1/4W, ± 5%, Carbon	6	Y
R601,602,603,604,701	ERD14TJ473	47kΩ, 1/4W, ± 5%, Carbon	5	Y
R412,413,414,415	ERD14TJ563	56kΩ, 1/4W, ± 5%, Carbon	4	Y
R424,425,426,427,436,437,438,439	ERD14TJ823	82kΩ, 1/4W, ± 5%, Carbon	8	Y
R310,401,405,406,407	ERD14TJ104	100kΩ, 1/4W, ± 5%, Carbon	5	Y
R301,302,304	ERD14TJ124	120kΩ, 1/4W, ± 5%, Carbon	3	Y
R308	ERD14TJ154	150kΩ, 1/4W, ± 5%, Carbon	1	Y
R306,307,309,	ERD14TJ334	330kΩ, 1/4W, ± 5%, Carbon	3	Y
R305	ERD14TJ394	390kΩ, 1/4W, ± 5%, Carbon	1	Y
R440,441,442,443	ERD14TJ564	560kΩ, 1/4W, ± 5%, Carbon	4	Y
R408,409,410,411	ERD14TJ684	680kΩ, 1/4W, ± 5%, Carbon	4	Y
R450	ERD12TJ470	47Ω, 1/2W, ± 5%, Carbon	1	Y
R303	ERD18FJ103	10kΩ, 1/8W, ± 5%, Carbon	1	Y
R805,806	ERC12GM155	1.5MΩ, 1/2W, ±20%, Solid	2	Y
R311,312,313,314,315,316	ERC12GM185	1.8MΩ, 1/2W, ±20%, Solid	6	Y
R801,802,803,804	ERC12GM335	3.3MΩ, 1/2W, ±20%, Solid	4	Y
VARIABLE RESISTORS				
VR301,405	EVLTOAA00B24	20kΩ(B), Wave & Bright Adjustment	2	X
VR401-1~401-4	EVB86AU30B15	100kΩ(B), Gain Control	1	Ⓝ X
VR402	EVLS3AA00B55	500kΩ (B), Wave Form Adjustment	2	X
VR403,404	EVLS3AA00B24	20kΩ (B), Wave Adjustment	2	X
VR704	EVCBTAU30B55	500kΩ (B), Scope Balance Control	1	Ⓝ X
VR705,706,707	EVCBTAU30B25	200kΩ (B), Position & Focus Control	3	X
VR708	EVCBTAU30B54	50kΩ (B), Bright Control	1	X
VR709	EVCBTAU20B55	500kΩ (B), Horizontal Control	1	X
CAPACITORS				
C309	ECQG05273KZN	0.027μF, 50WV, ±10%, Polyester	1	Z
C308,417	ECQG05104KZ	0.1μF, 50WV, ±10%, Polyester	2	Z
C701	ECQU2A103MD	0.01μF, 250WV, ±20%, Polyester	1	Z
C413,414,415,416	ECQM2104MZB	0.1μF, 200WV, ±20%, Polyester	4	Ⓝ Z
C301	ECQF4104M	0.1μF, 400WV, ±20%, Polyester	1	Z
C304,305,306,307	ECQH6474MZ	0.47μF, 630WV, ±20%, Polyester	4	Z
C409,410,411,412	ECEA6V220	220μF, 6.3WV, Electrolytic	4	Y
C401,402,403,404	ECEA16V10	10μF, 16WV, Electrolytic	4	Y
C405,406,407,408	ECEA25V10	10μF, 25WV, Electrolytic	4	Y
C420	ECEA25V100	100μF, 25WV, Electrolytic	1	Y
C418,419	ECEA35V1000	1000μF, 35WV, Electrolytic	2	Y
C303	ECEA50V1	1μF, 50WV, Electrolytic	1	Y
C302	ECEB50V100	100μF, 50WV, Electrolytic	1	Y
SWITCHES				
S1-1~S1-4, 4-1~4-4	SSLA6S	Input Selector, Scope Mode Switch	2	X
S2	SSRA28	Wave Form Selector Switch	1	Ⓝ X
S3-1~S3-6	SSRA27	Scope Selector Switch	1	Ⓝ X
S5-1~S5-4	RSS42A	Rear Phase Switch	1	X
S6	SSHA14S	Power Source Switch	1	X
LIGHTS				
PL3,4	XAM37K75	Light, L-F, L-R, R-R Indicator (7.5V 75mA)	2	X
PL1,2	XAM37K100	Light, R-F Indicator (7.5V 75mA)	2	X
PL5	XAM35K	Light, Power (6.3V 0.25A)	1	X
CABINET PARTS				
CA1	SGL29-2	Indicator, Panel Light	1	Z
CA2	SGX367	Mounting, Panel Light	1	Z
CA3	SUWA178S	Mounting, Panel	2	Z
CA4	SGWA960	Panel	1	Ⓝ Z
CA5	SGXA6001	Bracket, Lever Switch	2	Z
CA6	SGXA6002	Bracket, Power Switch	1	Z
CA7	SHRA601	Cover, Light	1	Z
CA8	XYN3DC8S	Screw, Panel M'tg.	4	Z
CA9	SUWA230S	Mounting, Panel	1	Z
CA10	XYN3DC6S	Screw, Panel M'tg.	2	Z
CA11	SGWA780	Ornament, Scope Scale	1	Ⓝ Z
	→ SYDA10A	Scale, Scope (Complete)	1	Ⓝ Y
CA12	SKDA260	Scale Plate (Order SYDA 10A)	(1)	
CA13	SGLA9001	Indicator, Wave Form (Order SYDA 10A)	(4)	
CA14	SHGA501-1	Bracket, Indicator (Order SYDA 10A)	(4)	
CA15	SHGA801-1	Cushion, Scope (Order SYDA 10A)	(1)	
CA16	SHPA907	Paper, Scope Scale (Order SYDA 10A)	(1)	
CA17	SHGA965	Rubber, Scope Scale (Order SYDA 10A)	(1)	
CA18	SBNA78	Knob, Position, Focus, Balance Control	4	X
CA19	SBNA59-1	Knob, Bright & Gain Control	2	X
CA20	SKAA570	Cabinet	1	Ⓝ Y
CA21	SBNA61	Knob, Lever Switch	2	Y
CA22	XSB4+10BVCS	Screw, Cabinet M'tg.	4	Z
CA23	SJFA3412	Terminal, Low Input	1	Z
CA24	SJFA4401	Terminal, High Input	1	Z
CA25	SGPA240A	Rear Panel	1	Ⓝ Z
CA26	SUVA48-1	Cover, CRT	1	Ⓝ Z
CA27	SGTA1260	Name Plate	1	Ⓝ Z
CA28	SJSA1	Socket, AC Power Source	1	Z
CA29	SNEA404	Nut, Ground Terminal [Outer]	1	Z
	SNEA204S	Screw, Ground Terminal	1	Z
CA30	SBNA34	Knob, Horizontal Adjustment	1	X
CA31	RHR111	Bushing, AC Cord	1	Z
CA32	RJA34	Cord, AC Power Source	1	Y
CA33	SHRA202	Leg	4	Z
CA34	SKUA212	Bottom Board Only	1	Z
	XSB3+8KS	Black Screw, Panel M'tg.	6	Z
	XTB4+8BR	Red Screw, Bottom Board M'tg.	9	Z
CA35	SBNA58	Knob, Scope & Wave Form Selector	2	X
CA36	SBCA34	Button, Power Switch	1	Y
CHASSIS PARTS				
CH1	SHPA907	Mounting, Scope Scale	1	Z
CH2	RMZ11A	Bracket, Light	1	Z
CH3	SMNA177S	Mounting, CRT	1	Z
CH4	RHG211	Cushion, Indicator Light	4	Z
CH5	SHGA614-1	Rubber, Lever Switch	2	Z
CH6	SMCA64	Shield Tube, CRT	1	Z
CH7	SMNA178	Mounting, CRT Lock	1	Z
CH8	SHGA965	Cushion, CRT	1	Z
CH9	SJSA8001	Socket, CRT	1	Z
CH10	SUVA49	Cover, High Voltage Unit	1	Z
CH11	RJV1A	Holder, Light	1	Z
CH12	TP-B18BA	Tape, CRT (25cm)	9 7/8"	Z
CH13	XSN3D20S	Screw, CRT Lock	1	Z
ACCESSORIES				
A1	SJP2129	Connecting Cord	2	Y
A2	SJPA3	Connecting Cord	1	Ⓝ Y
A3	WRLS-100CC	Connecting Lead Wire, Sky Blue	1	Z
A4	WRLO-100CC	Connecting Lead Wire, Orange	1	Z
A5	WRLR-100CC	Connecting Lead Wire, Red	1	Z
A6	WRLG-100CC	Connecting Lead Wire, Green	1	Z
A7	WRLA-100CC	Connecting Lead Wire, Blue	1	Z
PACKINGS PARTS				
P1	SPPA16-1	Soft Cover	1	Z
	SPEA3	Cover, AC Plug	1	Z
P2	SPHA2	Polyethylene Sheet	1	Z
P3	SPSA21	Pad [Inner]	1	Ⓝ Z
P4	SPSA23	Pad [Lower]	1	Ⓝ Z
P5	SPSA22	Pad [Upper]	1	Ⓝ Z
P6	SPGA50A	Carton Box	1	Ⓝ Z
P7	→ SQFA131	Printed Matter (Complete)	1	Ⓝ Y
	SQXA5082	Instructions Book (Order SQFA131)	(1)	

■ PACKING PARTS LOCATIONS



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